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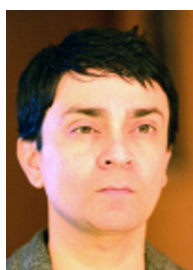
SYMPOSIUM: IVF - GLOBAL HISTORIES

The Indian IVF saga: a contested history

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Abstract The politics of conception in India can be traced back to the birth of the world's first test-tube baby in 1978. This article focuses on an incident where scientists and clinicians were involved in a heated contest over ascription of intellectual credit for the birth of the first test-tube baby in India. It traces the controversy surrounding claims and counter-claims within the medical domain that appear to have emerged as a corollary to the rapid expansion of assisted conception in India. The article emphasizes the fact that this contentious issue played out largely in the media and shows that the generation of scientific credibility and reward is produced and ascribed both inside and outside the scientific domain. In so doing the article offers a glimpse into the unique ability of cultural activity to shape and recast the perception of science and scientific outcomes.

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KEYWORDS: controversy, credibility, credit, India, IVF, media

Introduction

The history of IVF in India is debatably as old as the history of IVF itself. Its origin was contested and its subsequent development no less so. IVF laid the foundation for assisted conception treatment in India and created the ground on which contests for the legitimate ownership of the first 'test-tube baby miracle' were fought.

IVF in India became a contested terrain in part because of the pursuit for credit (reward) and credibility (ability to do science) by its practitioners (Latour and Woolgar, 1979).

However, this article hopes to show that the construction and validation of scientific and technological knowledge is not only a mutual give-and-take between scientists (Latour and Woolgar, 1979) but is also part of a wider social network that includes the media as one of the key players. The pursuit of credit and credibility in the Indian IVF saga was amplified by the media's rhetoric on assisted conception techniques as the long-awaited answer to the biosocial problem of infertility (Bharadwaj, 2000). The media thus became one of the prominent domains in which the contested beginnings of IVF were settled. This article charts an important fragment of contemporary history of IVF in

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India by bringing together key moments in its development. It attempts to reveal the politics underscoring assisted conception by focusing on the disputed claims of various medical practitioners at the forefront of producing the first test-tube baby in India. The story of the first IVF baby in India reveals a rejection by the scientific community of claims unsubstantiated by peer review (also see [Bharadwaj, 2013a,b,c](#)). The article argues that the pursuit of peer-endorsed credibility is not always a key motivation for scientists and scientific work and that the generation and attribution of scientific credibility is fundamentally multi-centred, spread across domains such as clinics, laboratories and the media. In arguing the importance of politics and power relations in the practice of science, the ways in which scientific 'facts' are constructed and contested are revealed.

The development of IVF in India is largely dependent on several interconnected factors. First, the 'experts' successfully left the state sector in order to function with an otherwise unattainable degree of autonomy and freedom. Second, once they had left, they used the media not only to carve out a niche in the infertility market, but also, more importantly, to set in motion a competition for respect, status and credit. Indeed, many media accounts of assisted conception in the 1980s and 1990s appear as little more than attempts to promote the reach and penetration of various practitioners in the infertility market, creating a media/medicine nexus. By the closing years of the 1980s the story of assisted conception took a new turn with the rapid emergence of new players in the field. Scientists and clinicians enthused by the results of the media 'binge' on the success of the 'first scientifically documented test tube baby' took the plunge to claim their share of media credit and recognition (for details, see [Bharadwaj, 2000](#)). Third, since 1991, India, in line with its policy of economic liberalization, has incentivized technological management of infertility. Fourth, the stigma attached to infertility and an almost oppressive cultural expectation to contribute living children to society ([Bharadwaj, 2016](#)) has increased existing demand for treatment in the face of new technological breakthroughs. Fifth, the segment of the Indian medical tourism market dedicated to assisted reproduction was valued at over \$450 million per annum, and the Indian Council of Medical Research (ICMR) predicted this to grow to a \$6 billion market by 2008 ([Smerdon, 2009](#)). No current assessments indicate whether this gargantuan figure has now been reached or surpassed. Sixth, IVF has enjoyed almost unregulated growth in the private sector. While the ICMR has formulated extensive guidelines, these have been awaiting ratification by the Indian Parliament for over a decade and still remain as mere guidelines. Additionally, the ICMR introduced a centralized registry which currently lists 385 clinics. However, estimates of the number of IVF clinics operating in India continue to vary widely. For example, as of 2010, the International Federation of Fertility Societies had reported more than 500 IVF clinics in the country ([Jones et al., 2010](#)), whereas some rather more speculative calculations predict over 30,000 functioning assisted reproductive technology facilities in India ([Sarojini et al., 2011](#)).

Materials and methods

This article is embedded in an ethnographic project spanning 15 years. During this period the author returned to India at least once every year to (re)establish contact with over 30 IVF clinics and track new developments. The article is based on data distilled from daily newspapers, popular magazines, articles in science journals, television reports, documentaries, talk shows and serialized programmes to piece together evidence scattered over multiple terrains of analysis and description. There is further engagement with government reports, guidelines and proposed regulatory bills. Information on television programmes was obtained from informant doctors as part of the fieldwork and cannot be referenced, as exact broadcast dates are unavailable. Excerpts from two interviews with research scientists on the sensitive topic of tensions underscoring the history of IVF in India could not be tape recorded. The persons concerned were anxious to speak but requested complete anonymity. The identities of those covered in media reports are not concealed as these names are already in the public domain. Anonymization in this latter case is highly unlikely to succeed, as the key protagonists featured in the article are virtually synonymous with developments related to IVF in India. The research reported here fulfils all prevailing institutional ethical requirements and data protection procedures.

The past rewritten

With the birth of the first 'scientifically documented' test-tube baby, Harsha, on 6 August 1986, India officially entered the brave new world of assisted conception. The use of the term 'scientifically documented' is deliberate, as it was repeated *ad nauseam* in scientific circles to negate the parallel claims of a similar breakthrough made by a doctor in 1978, only months after the birth of the world's very first test-tube baby, Louise Brown, in the UK.

On 3 October 1978, the birth of the world's second test-tube baby was announced by Dr Subhas Mukerji in Calcutta. The news was widely reported in the media in India and to some extent abroad. Mukerji's claim, however, was contested because he did not publish the bulk of his research work in standard peer-reviewed journals. Ironically, 19 years later, the story of Mukerji's test-tube baby was retold by Dr TC Anand Kumar, the man most closely associated with India's first 'scientifically documented' IVF baby. It was Anand Kumar and his collaborators in Bombay who produced Harsha as India's 'first' test-tube baby. By Anand Kumar's own admission, 'Harsha was described as India's first "scientifically documented" test-tube baby because the details of Mukerji's work were not then available' ([Anand Kumar, 1997: 526](#)). Delivering the Subhas Mukerji Memorial Oration at the third National Congress on Assisted Reproductive Technology and Advances in Infertility Management, held in Calcutta on 8 February 1997, Anand Kumar made an appeal that Mukerji should be credited posthumously for creating India's first test-tube baby. Two months later, he followed up his appeal with the publication of an article in the journal *Current Science*, entitled 'Architect of India's first test tube baby: Dr Subhas Mukerji (16 January 1931 to 19 July 1981)' ([Anand Kumar, 1997](#)). The story of Mukerji's long-forgotten past was resurrected with the publication of this article. Kumar's

argument forcefully supported the claim – which he personally had come to believe – that Mukerji did indeed produce India's first test-tube baby in 1978.

Mukerji was a medical graduate of Calcutta University, where he also obtained a DPhil. He was awarded the Colombo Plan scholarship to work in the MRC Clinical Endocrinology Research Unit in Edinburgh under Professor John A Loraine, a reproductive physiologist. In his paper, [Anand Kumar \(1997\)](#) offers an exhaustive documentation of Mukerji's presentations at various scientific and public fora, along with detailed descriptions of his research interests and analysis of the IVF technique that he employed to produce a baby girl, who was given the pseudonym Durga. Anand Kumar undertook this systematic exercise to demonstrate that, even in the absence of published scientific papers in leading journals, Mukerji's work was truly monumental and ground-breaking. According to Anand Kumar, Mukerji was 'far ahead of his time in successfully using an ovarian stimulation protocol before anyone else in the world had thought of doing so' (529). He continues:

It may be noted that Subhas Mukerji reported the successful cryopreservation of an eight-cell embryo, storing it for 53 days, thawing and replacing it into the mother's womb, resulting in a successful and live birth as early as 1978 – a full five years before anyone else had done so. This small publication of Mukerji in 1978 clearly shows that Mukerji was on the right line of thinking much before anyone else had demonstrated the successful outcome of a pregnancy following the transfer of an eight-cell frozen-thawed embryo into human subjects transferring eight-cell cryopreserved embryos (530).

After this breakthrough, Mukerji's happiness was short-lived. The government of West Bengal appointed an 'expert committee' under the Indian Medical Association and the Bengal Obstetrics and Gynecology Association to investigate the veracity of Mukerji's claims. The inquiry committee met on 18 November 1978, to critically review Mukerji's report to the West Bengal Government's Director of Health Services (DHS); they rejected Mukerji's claim. Anand Kumar questions this, as the committee was headed by a professor of radiophysics and composed of a gynaecologist, physiologist and neurophysiologist. None of these committee members, he argues, 'could have had any background or insight into modern reproductive technologies, a subject upon which they were to hold an inquiry' (1997: 528).

In a letter to the DHS dated 1 December 1978, Mukerji states he needs adequate time to prepare the report on his work. Because the report was hurriedly assembled in about two weeks after the committee's decision, Mukerji felt he had inadequate time to plead his case in detail. However, Anand Kumar claims:

With very sound reasoning, Mukerji did not reveal all his data because he wanted to 'publish these in recognized scientific journals after the reproducibility of the work is reasonably assured'. [Mukerji] went on to state: 'The final concentration of DMSO used before freezing as well as the exact indigenous method of cooling were deliberately omitted from the report, like (also) the steps for removal of DMSO before thawing. Certain essential intermediate steps, during the whole procedures also involving the use of undisclosed and enriched media were completely omitted. I had to be careful to guard our unpublished data, because by that

time I became aware of the penetrating efficiency of the tentacles of the mass media' (528).

Mukerji had to pay dearly for withholding this crucial information. Not only was his claim rejected by the committee, but the DHS also imposed strict restrictions, preventing him from attending any conference without prior permission. Anand Kumar provides a detailed account of events leading up to Mukerji's mental and emotional deterioration:

Mukerji was invited by the Primate Research Centre of Kyoto University, Japan, on 25 January 1979, to attend a closed meeting at their expense to discuss details of Mukerji's work. Mukerji applied to the DHS for permission, which was promptly denied via their letter of 16 February 1979. The letter directed Mukerji not to leave the country without prior clearance from the government. Subhas Mukerji shortly afterwards suffered a heart attack. His request for special leave was declined, but his request for transfer was promptly accepted and, at 'the pleasure of the Governor of West Bengal', he was transferred to the Regional Institute of Ophthalmology as a professor of electrophysiology on 5 June 1981. The government, preventing him from presenting his work at scientific meetings, denied him leave to write up his results, and the humiliation he was subjected to by his colleagues in Calcutta were things that the sensitive Subhas Mukerji could not bear. His transfer to a department in which he had no expertise was the last straw on the proverbial camel's back for Mukerji. This transfer order was dated 5 June 1981. Mukerji gave up fighting the system and ended his life on 19 July 1981, 44 days after the transfer order was issued. Much of Mukerji's work remained unpublished not because he did not have data but because he was not given a chance to do so by his administrative Ministry in the Government (530–31).

Anand Kumar was not the first to report on the events leading up to Mukerji's suicide. [Corea \(1985\)](#) described in great detail how Patrick Steptoe and Robert Edward's success led to a scramble amongst gynaecologists and physiologists across the world. Drawing on Mukerji's interview given to CBS reporter Jay McMullen, and on Rajan Gupta's report in the *Sydney Morning Herald* on Mukerji's suicide, [Corea \(1985: 139\)](#) gives an account of Mukerji's claim and eventual suicide. However, the impact of Anand Kumar's appeal extended beyond the medical community. Sixteen years after Mukerji's suicide, a Calcutta English daily newspaper, *The Telegraph*, reported that India's medical establishment was under pressure to recognize the doctor's work ([Mukherjee, 1997](#)). The same article reported that Mukerji's wife was living in 'a twilight of physical pain and bittersweet memories and believed that all the moves to recognize her husband's work posthumously would not "bring him back"'. She, on the contrary, hoped for the establishment of a more supportive scientific environment than the one that drove her husband to his death.

This sentiment notwithstanding, Anand Kumar's assertions at the Calcutta conference were reported in the major national dailies and in the regional press – assertions such as 'let me tell you that Subhash Mukerji must be given credit for producing the first test-tube baby', and 'all other achievements dwarf in comparison to what he achieved' ([Mukherjee,](#)

1997). The focus simultaneously shifted to Mukerji's 'miracle', Durga, whose identity and that of her parents had been hidden for 18 years. Headlines such as 'Test Tube Baby's Parents Reveal All, Resurrect Scorned Scientist' in Calcutta's *Telegraph* (Mukherjee, 1997) and 'Test Tube Baby, Now 18, is Ready to Talk' in New Delhi's *Hindustan Times* (19 February 1997) added to the drama. These media accounts unanimously identified Mukerji's biggest shortcoming as his inability to physically produce the baby as evidence to consolidate his claim. Fearing social ostracism, Durga's parents had not allowed Mukerji to publicize the details of their daughter's birth in 1978, and Anand Kumar spoke of the Indian 'psyche' that considers barrenness to be a curse (ibid.).

Twenty years later, the story became news as a result of Anand Kumar's efforts. What is interesting, however, is the evangelical zeal with which Anand Kumar campaigned to clear Mukerji's name. The situation is further complicated given the fact that, by highlighting the whole issue, Anand Kumar stood to lose his claim of association with the first scientifically documented test-tube baby, Harsha. Recognizing Mukerji as the 'scientific father' of the first Indian test-tube baby, and the second-only test-tube baby in the world, requires a degree of peer recognition and scientific validation from the Indian scientific community that would mark a fundamental shift in the definition of the first 'scientifically documented test-tube baby in India'. That is to say, the present claim to the first test-tube baby would have to be abandoned in favour of the earlier claim of Mukerji, and Harsha would have to be replaced by Durga. This construction of the 'first scientific baby produced from a test tube' is at the heart of the contested terrain of assisted conception in India. I attempt to highlight the problems surrounding these strategies and clashes of ambitions in the following section.

Birthing a contest

As discussed, there was an ongoing campaign to credit Mukerji for engineering India's first, and the world's second, test-tube baby. The genesis of ascription of 'proper credit' may be traced back to the birth of India's first 'scientifically documented' test-tube baby, Harsha, when the actual credit allocation, following the media aftermath of the breakthrough, completely disrupted the credibility cycle of the scientific team responsible for the feat. What emerged was a fundamental distinction between the multi-sited nature of both credibility production and credibility allocation. There was a divergence between credit and credibility as it emerged from peers versus the media.

Baby Harsha was the product of a collaboration between an institute controlled by the ICMR and a Bombay public hospital. The scientific team was popularly believed (for reasons that will become clear below) to be headed by the collaborating pair of Anand Kumar, the medical director of the Institute for Research in Reproduction, Bombay (IRR), and Dr Indira Hinduja, a gynaecologist from the King Edward Memorial Hospital, Bombay (KEM). The rest of the team was composed of both senior and junior scientists. With the completion of the IVF project in 1985 and 1986, India's first test-tube baby became a peer-reviewed reality (ICMR, 1986). Even though the information first appeared in the

ICMR Annual Report and did not offer the exact scientific details, it opened the way for scientific engagement and peer review. The publication cited the contributing team members before more detailed data on the technique and other accomplishments were revealed.

ICMR Annual Report

Title of Project 11.8. *In vitro* Fertilization and Embryo Transfer: A collaborative project between the KEM Hospital and the Institute for Research in Reproduction.

Project Leader Dr T. C. Anand Kumar
 Project Staff Dr J. V. Iyer, Dr G. M. Ranga
 Project Collaborators Dr I. Hinduja, KEM. Hospital
 Dr C. P. Puri, I.R.R.
 Dr T. D. Nandedkar, I.R.R.
 Dr K. Gopalkrishnan, I.R.R.
 Dr R. Asok Kumar, I.R.R.
 Time of starting August 1985
 Approximate duration Five years
 Provisional date of completion 1990

The article goes on to state that the 'in-vitro fertilization and embryo transfer technique has been perfected and performed as a collaborative project between the KEM Hospital and the IRR. This has resulted in the birth of the country's first ever, scientifically documented, test-tube baby' (1986: 74).

The project leader and project collaborators are clearly identified in the article. Hinduja is but one amongst five collaborators under the project leader, Anand Kumar. The inclusion of the KEM Hospital as a collaborating partner recognizes Hinduja's links with the hospital. Together IRR and KEM created India's first scientifically documented test-tube baby.

India learned of this breakthrough on *Doordarshan*, national television's evening news, on the evening of 6 August 1986:

The first test-tube baby in India was born to Mrs. Mani Chawda, a twenty-four-year-old housewife at KEM Hospital Bombay. Our Bombay correspondent reports:

'A pretty and healthy baby girl weighing 2.8 kgs has become India's first scientifically documented test-tube baby. She was born to Mani Shanti Chawda at KEM Hospital this afternoon at the hands of Dr Indira Hinduja. The baby was delivered by Caesarean section. This tiny bundle is India's first successful case of conception using the *in vitro* fertilization technique, where the sperm and ovum are fertilized outside the mother's womb and fetus transferred inside her for development. Dr Hinduja successfully used the technique in close co-operation with Dr Anand Kumar and his institute for Research in Reproduction in Bombay. We spoke to Dr Hinduja and the child's father, Shanti Kumar'.

The very first media account shifted the balance of credit in favour of Hinduja. For over 10 years, media reporting uncritically reproduced the above narrative. The precise reasons for this are not clear. However, globally it is not uncommon for 'breaking news' items to gain momentum and become an untested and uncontested truth claim. In large

part it was this precise 'media truth claim' that Anand Kumar's intervention in 1997 problematized. Throughout the news report, Hinduja was shown with the baby and the hospital staff and, even as she was interviewed on camera, project leader Anand Kumar could only be seen standing quietly next to her. In subsequent coverage, the reporter found it more newsworthy to interview the father of the baby than the project leader, whose name was mentioned only in passing as a close collaborator. Thus, in the evening news, Hinduja practically walked away as the project leader who, in close cooperation with Dr Anand Kumar, produced India's first scientifically documented test-tube baby. In a matter of hours, from being one of the five project collaborators, Hinduja became the person who delivered India's first test-tube baby, and Anand Kumar fell from the position of project leader to that of close collaborator.

The media frenzy that followed the announcement further developed the account provided in *Doordarshan's* evening bulletin. All leading daily newspapers were splashed with pictures and news items on Hinduja, the newborn wonder and her parents. Anand Kumar and the rest of the collaborating scientific team were lost to the public gaze in this media melee. Nor did media interest abate with time. With the dawn of the 1990s, the field of assisted conception was fully embraced by the popular media. Coverage of infertility and of scientific advancements in its management had become louder and shriller ([Indian Express, Bombay, 1994a,b](#); [Indian Express, Bombay, 1998](#); [Sunday Observer, 1994, 1995](#); [The Illustrated Weekly of India, 1991](#); [The Sunday Times of India \(Delhi\), 1997](#); [The Times of India \(Bombay\), 1997](#); [The Times of India, 1998](#)). The intense interest generated in the media by assisted conception was further accentuated by the entrance of newer players in the field. Hinduja had become a cult figure as far as IVF and other related reporting was concerned. No media account could begin without paying tribute to the ground-breaking achievement of the lady 'who did it first'.

Contesting claims

On 4 November 1990, in the English-language magazine *The Week*, an article appeared: 'An ill-conceived move: Research rivalry leads to winding up of test-tube baby project'. The article blamed the ICMR for concluding the test-tube baby project at the IRR, Bombay. The article began by rather dramatically asserting that the IRR was barely a 'test tube's throw away' from the King Edward Memorial Hospital of Bombay, and yet a 'yawning gulf' had suddenly emerged between the two, whose joint effort saw the birth of India's first test-tube baby ([Rao, 1990](#)). The article went on to quote the director of ICMR:

Dr AS Paintal, director of the ICMR, under whose wings IRR has been hiding cosily all these years, had this belated explanation: 'The major reason for winding up the IVF unit is that Dr Indira Hinduja's (she was the brain behind India's first test-tube baby) project has already proved its success. and we thought she could continue her studies outside, whereas the IRR's funds could be utilised for other important projects' ([Rao, 1990](#)).

There are two very interesting indications in this extract. First, as early as 1990 it appears firmly established even in the

official (ICMR) circles that the test-tube baby was Hinduja's project. It is surprising that the director in the previous quote describes the project – funded by a government council (ICMR) and executed by an institute (IRR), supported in collaboration with a public hospital (KEM) – as 'Dr Hinduja's project'. It tells us something significant about the inroads made by the media and by popular representations of India's first scientifically documented test-tube baby into the official vocabulary. Second, it exposes the enunciatory function of the media. The information provided in the all-important brackets, inserted into the objective quote of the interviewee, is made available for the less-informed reader who, in case he or she had missed the crucial details about Hinduja's central role, should be made aware of 'the brain' behind the project. The article goes on to state that slashing the ICMR's Rs 340 million budget by 20% is used to justify the project's termination and further asserts that the figure of Rs 10 million 'gobbled up by IVF is inflated perhaps to justify its killing' ([Rao, 1990](#)). Citing modest expenses on the project (from the IRR annual report), the article goes on to argue that the test-tube baby research was never a 'white elephant' for the IRR. The root of the problem is attributed to conflict of interest within the IRR:

Another vital aspect is professional jealousy: the impression that Hinduja, who is on the rolls of the KEM Hospital, has been hogging the limelight and depriving the IRR scientists, who have been handling the lab side of the IVF project, [of] their share of the glory. Ironically, there was perfect harmony within the IVF unit, but the so-called experts within the IRR who have nothing to do with the IVF project have been fomenting trouble ([Rao, 1990](#)).

Although this article makes a strong case for the IVF team's faultless harmony, the team members gave a very different account when I contacted them, on the condition of strict anonymity. One team member, when contacted on 13 and 21 April 1998, spoke of the gynaecologists' 'arrogant' and 'uncompromising' attitude, which led to the project's collapse. 'The publicity-hungry individuals associated with the project', the informant went on to say, 'created an atmosphere of dejection and frustration' amongst the real scientific 'think tank' behind the project. Those involved were reported as pulling in different directions: whereas some were more interested in 'promoting themselves', others were too 'disgruntled' because their 'behind-the-scenes hard work was not being appreciated' and they were being 'systematically side-tracked', even as the limelight remained on a chosen few.

The tendency to eclipse the 'other' emerges as the basis of this contest for credibility. On the one hand, the scientific team claims it was kept at arm's length from credit (reward) and their credibility (ability to do science) could not attain its potential because they were marginalized. On the other hand, the principals, Anand Kumar and Hinduja, appear to have pursued an approach of mutual obfuscation. There are few documented media accounts where one openly refers to the other as a collaborating partner. The closest each protagonist comes to acknowledging the other in interviews and in other accounts on the issue of the first test-tube baby is to name the collaborating institutes. The two institutes have been bestowed with a metonymic quality, representing respectively the two collaborators. Anand Kumar, for instance, made the following assertion in his article on Mukerji:

The organisers of the recent Calcutta meeting believed that I was pre-eminently qualified and experienced to delve into whatever material was available regarding Mukerji's past work and throw light on it. The reason for this assumption perhaps lay in my having played a key role in the birth of another test-tube baby, Harsha, on 6 August 1986. This birth was announced by myself, when I was the director of the ICMR's Institute for Research in Reproduction, and Dr. G. B. Parulekar, dean of our collaborating institution, KEM Hospital, Bombay... I published our technical report and procedural details in the ICMR *Bulletin*. The work leading to Harsha's birth was executed by a team of scientists from the IRR and clinicians from the KEM Hospital working under my direct guidance and supervision (1997: 526).

The argument is bluntly clear on three counts. First, the name 'Hinduja', which had become synonymous in the media with the birth of the first test-tube baby, is absent. Her 'claims' are openly resisted by reminding the readers of the ICMR *Bulletin* (cited previously). The primacy of peer-reviewed documentation over popular media accounts is openly asserted. It is also noteworthy that Hinduja's name is conspicuously absent, even while the KEM Hospital and the name of the dean of the collaborating institute is included. Second, the distinction between the IRR and KEM is constructed on a clear-cut scientific hierarchy of scientists over clinicians. A sense of our (IRR) scientists and their (KEM) clinicians is asserted to reclaim the 'reality' glossed over by media representations, such as Hinduja as 'the brain' behind the project. Third, and of most significance, is the emphasis on phrases such as 'key role' and 'my direct guidance and supervision', which completely underplay the importance and even the extent of the collaborating hospital's contribution and its now-famous collaborating partner, Dr Indira Hinduja.

End of a saga

In 2016 the controversy seems settled. On 26 January 2010, Anand Kumar passed away, ending his illustrious career. A glowing obituary in the *Indian Journal of Medical Research* (2010) observes:

A man who stood for truth had the greatness to give away his fame and glory of being the pioneer of India's first test-tube baby when he discovered all the handwritten notes of Dr Subhas Mukerjee. Dr Mukerjee from Kolkata had claimed to have created a test-tube baby in 1979 (the second in the world), but his claims were neither substantiated nor recognized by scientists nor the authorities, leading to the man ending his life prematurely. Dr Anand Kumar had the courage to research his predecessors' findings and scientifically present it to the world, giving Dr Mukerjee his due place in medical history. Such generosity and honesty are very rare and precious attributes of Dr Anand Kumar (Mehta, 2010: 466–67).

Anand Kumar succeeded in crediting Mukerji as the pioneer of Indian IVF. He lived to see many landmark developments post-1997, following his concerted efforts. In 2002, the ICMR acknowledged Mukerji's contributions in the National Guidelines for Accreditation, Supervision and Regulation of ART Clinics in India. In 2004, the ICMR director

delivered a memorial oration named after Mukerji. In 2005, as a rather belated sign of recognition, the West Bengal Health and Family Welfare Department erected a plaque in Mukerji's memory. In 2007, Mukerji's life story and work were published in the *Dictionary of Medical Biography* by the London-based Wellcome Trust Centre for the History of Medicine. These accolades further cemented the claim that Mukerji was responsible for the second test-tube baby in the world within two months of Steptoe and Edwards's breakthrough. In the same year, 2007, Mukerji's work was recognized by the Brazilian Medical Society in Sao Paulo. Predictably, a controversy born and bred in the mass media had a very public culmination in the media spotlight. In April 2011, India's 'first test-tube baby' broke her silence and appeared as the cover story, 'The Doc Who Gave Me Life and Killed Himself', in a popular Indian weekly magazine, *The Week* (3 April 2011). The editorial reads:

Angst lay buried in their bosom for 30 years, heaving with muted melancholy every now and then. They allowed hope to bloom instead. Now, two women who are part of one of India's biggest achievements have decided to bare their heart (sic)...in this week's cover story, both reveal the beauty and the beast behind what is now accepted as India's first test-tube baby. One woman is the test-tube baby; the other is the wife of the man who was hounded and called a fraud, making him end the misery by taking his life...It may be a story straight out of the Roald Dahl stable—dark, depressing, and sad—but it is also about hope. It has many heroes: a crusading Sunit Mukherjee, who continued to believe that his friend Subhas the pioneer was a genius; the wife who stood by her husband who chose his research over her; Kanupriya's ['the first test-tube baby'] parents, who decided to take a gamble; T. C. Anand Kumar, who chose to give up his claim to history to hand it over to a man who had been discredited; and finally Kanupriya, who was brave enough to come out and lend her voice to this cause. 'Dr Anand told me Subhas Mukherji did this because he had to, for the greater cause of humanity. It wasn't just for me', she says. 'I can't let him go down in history as a wannabe', Kanupriya adds. Neither should India.'

(Matthew, 2011: 3)

The history of Indian IVF was rewritten on the confluence of a series of contests, claims, counter-claims and eventual closure. The history of IVF in India also mirrors the uneven nature of global scientific terrain and the contests over demarcations that cordon off normative 'good science' from in-compliant and maverick 'bad science' (Bharadwaj, 2013b). Adjudicating 'good' and 'bad' modality of doing science can have its own rewards. For example, by raising Mukerji's claim, Anand Kumar stood to lose his association with the birth of India's first test-tube baby. However, it can be hypothesized that Anand Kumar lost nothing at all, as his credibility – which is well documented in peer citations – remains intact. The professional credit of being associated with the first scientifically documented test-tube baby is more or less secure. What he lacked, however, was credit of a different kind that no number of peer citations can generate. This credit or reward is what his scientific partner, Hinduja, walked away with. While Hinduja basked in the spotlight of the media, her peers also recognize her as an able scientist and clinician.

Conclusion

Production of scientific credibility is multi-sited. The credibility generated by media accounts can obfuscate peer-reviewed scientific endorsements. As argued elsewhere, in the closing decade of the 20th century journalistic discourses on science in India became fixated with a 'marvels of science' style (Bharadwaj, 2000: 63). The media/medicine nexus at this time morphed news reportage into publicity-driven 'institutional advertisements' (Dyck, 1995). In the late 1990s, many entrepreneurial IVF practitioners in India were actively engaged in a process of ingratiation with journalists to ensure favourable depiction in the media (AB, field notes). This is not to suggest that the protagonists in this article were similarly implicated. On the contrary, their reputations were clearly established as pioneers in the field thanks to the high-profile events of 1986 and 1997. However, what the article has tried to show is that the peer-documented credit Hinduja and Anand Kumar shared is different from the credit generated by media accounts, which focused on Hinduja alone until 1997.

More generally, credibility (i.e. a scientist's ability to do science) is only a point of departure. The continual upkeep and regeneration, through a quest for credible reward and recognition, are the mainstays of scientific enterprise when it acquires a commercial face. This helps us understand how scientists respond to demands made outside the scientific terrain. There, the market (infertile patients) judges the credibility of an expert not from what his or her peers have to say – though that is centrally important to the scientists' survival in their own field – but more from media representation of the experts. The media adulation and 'institutional advertisements' further cemented the reputation of the protagonists in this story as India's leading experts in the field. However, this is not to suggest that the media helped perpetuate a fiction in the marketplace. At best it can be hypothesized that experts with painstakingly earned, peer-endorsed reputations were turned into household names for a period of time, which furthered their reach into the infertility market. In this respect it is important to conceptually separate credit and credibility because publicity and media interest generate not only commercial gain but also fame. It would be unfair to assert that the protagonists in this story were motivated simply by pursuit of financial reward. But rather, as the article has shown, their struggles were first and foremost over redistribution of proper credit and recognition.

Additionally, the history of IVF echoes a consistent feature within Indian scientific imaginary: the presence of a non-conformist, sometimes eccentric, albeit largely condemned, maverick and an extremely charismatic scientist and/or clinician, working alone and often against mounting global condemnation (also see Bharadwaj, 2013a,b,c). To this day, IVF is still producing wilful and 'fringe' practitioners in India like Mukerji who dare to rewrite the rules authored elsewhere in the world of 'big science' and 'big capital', located in value chains that stretch from 'big geopolitical' spheres of influence to 'big global scientific conglomerations'. In this respect the Indian IVF saga offers a unique antidote to an approach to history that Dipesh Chakrabarty describes as based on the conviction:

first in the West and then elsewhere (Chakrabarty, 2000: 6). That is, the events documented in this article also help us to imagine how Mukerji's losing battle was only possible in a normative global order where Europe is seen as the only viable crucible of breakthrough innovations. This view reinforces an active imagination of all other modes of innovation as merely provincial and thus obfuscates the actual flow of ideas across the geopolitical landscape of science in the 20th century. In the end this also explains the irony-saturated history of IVF. While Edwards, the IVF pioneer in Britain, eventually received a Nobel Prize for his contribution (albeit more than 30 years after the event), Mukerji, a controversial 'maverick' in India, was driven to suicide and forgotten, only remembered posthumously as part of contemporary battles over scientific prestige and pre-eminence that animate current stakes in India's reputation as a leader in reproductive medicine.

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